Space Weather Forecast

Issued on Thursday, 11 January 2024 at 01:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Ongoing likelihood of Moderate flares, with a slight chance of Strong flares

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with two Moderate flares observed, including an M1.9 from a sunspot region nearing the northwest limb at 10/2328 UTC and another M1.4 flare observed from an unknown region just over the southeast limb peaking at 10/1255 UTC. There are eleven sunspot region on the disc, with frequent Common class flaring observed. Some growth has been observed in the region near the northwest limb but this is hard to assess. Growth was also observed in a further region on the northwest limb, nearer central disc, with a small opposite polarity region developing near its trailer region, suggesting some increased complexity. On the southern disc, growth was also observed near the trailer of one of a pair of sunspots near the central meridian, leading to a complex structure developing. A further region in the southeast also continued it's ongoing, but slowing growth though remained relatively simple in terms of magnetic structure. A new region also developed in the northeast. The other six regions remained smaller and simpler, and either stable or decaying.

A couple of coronal mass ejections (CMEs) were observed, including a large and impressive eruption from just over the east limb at around 10/2030 UTC. None of these have Earth-directed components.

Solar Wind / Geomagnetic Activity: Solar winds remained at background to slightly elevated speeds varying between 370 km/s and 410 km/s. Interplanetary magnetic field (IMF) was initially weak, but became Moderate from 10/0800 UTC. The north-south component varied between being weakly north and weakly southward pointed. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained only very slightly above background levels after the enhancement due to the flare on New Year's Eve, but still gradually declining and well below the level of a solar radiation storm (S1).

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely to continue with further Moderate class flares, and a slight chance of isolated Strong class flares.

Solar Wind / Geomagnetic Activity: There is a potential glancing CME arrival. This left the Sun on 09 Jan due to a filament eruption in the southeast disc, and gives a chance of a very slight glance Day 3 (13 Jan). Otherwise background to slightly elevated wind speeds are expected. Quiet geomagnetic conditions are expected for much of the period, but may rise to give a spell of Unsettled with a chance of Active with any glancing CME.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue declining to background. However, there is a slight chance of rising to a minor radiation storm (S1) or greater, should there be any notable flare activity.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	60	55	50
Very Active	R3 to R5 X	No	15	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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